

WHAT IS CLAIMED IS:

1. An exposure method for projecting a desired pattern on an object to be exposed utilizing a reflective mask for an exposure light, comprising the steps of:

providing respective reflective mask each having a mask pattern consisting of only pattern forming elements of the same direction with regard to the respective longitudinal direction by dividing pattern forming elements of the mask pattern corresponding to said desired pattern relative to a projection vector of the exposure light;

sequentially carrying out projection of said mask pattern on said object to be exposed by irradiating said exposure light and its reflection light with regard to respective reflective mask in the respective direction; and

12 rotating, when one reflective mask is changed to the other reflective mask, said other reflective mask and said object to be exposed so that an angle of the pattern forming elements of said the other reflective mask and the projection vector becomes equal to an angle of the pattern forming elements of said one reflective mask and the projection vector.

18 2. The exposure method as cited in Claim 1, wherein
said reflective mask of the respective direction includes a V-line mask having a pattern only including the pattern forming elements perpendicular to said projection vector, and an H-line mask having a pattern only including the pattern forming elements horizontal to said projection vector.

24 3. The exposure method as cited in Claim 1, wherein
said exposure light is one of a charged particle beam, an X-ray, an Extreme Ultra Violet ray, an Ultra Violet ray, and a visible light.

4. The exposure method as cited in Claim 3, wherein
said charged particle beam is one of an electron beam and an ion beam.

30 5. The exposure method as cited in Claim 2, wherein
a perpendicular direction of the mask pattern including the pattern forming

elements formed on said V-line mask relative to said projection vector corresponds to an scanning direction of an exposure apparatus.

6. The exposure method as cited in Claim 1, wherein
a rotation angle of said rotation is approximately 90 degrees with regard to said
6 object to be exposed.

7. The exposure method as cited in Claim 1, wherein
said projection process is sequentially carried out twice or more than twice.

8. A mask fabrication method for projecting a desired pattern on an object to
12 be exposed utilizing a reflective mask for an exposure light, comprising the steps of:

dividing pattern forming elements of a mask pattern corresponding to said
desired pattern with regard to respective direction relative to a projection vector of the
exposure light;

18 forming respective reflective mask each having a mask pattern consisting of
only pattern forming elements of the same direction with regard to the respective
direction; and

forming respective reflective mask of respective direction so that when the
reflective mask and said object to be exposed are rotated relative to said projection
vector, an angle of the pattern forming elements of respective reflective mask and the
projection vector is always the same.

24 9. The mask fabrication method as cited in Claim 8, wherein
said reflective mask of the respective direction includes a V-line mask having a
pattern only including the pattern forming elements perpendicular to said projection
vector, and an H-line mask having a pattern only including the pattern forming elements
horizontal to said projection vector.

30 10. The mask fabrication method as cited in Claim 8, wherein
said exposure light is one of a charged particle beam, an X-ray, an Extreme
Ultra Violet ray, an Ultra Violet ray, and a visible light.

11. The mask fabrication method as cited in Claim 10, wherein
said charged particle beam is one of an electron beam and an ion beam.

12. The mask fabrication method as cited in Claim 9, wherein
6 a perpendicular direction of the mask pattern including the pattern forming
elements formed on said V-line mask relative to said projection vector corresponds to an
scanning direction of an exposure apparatus.

13. The mask fabrication method as cited in Claim 9, wherein
12 said dividing process for the mask pattern corresponding to the desired pattern
includes:

18 erasing desired size data in the X direction with the under size or over-size only
in the X direction from an input design data;

extracting H-line data which is graphic data of only X direction; and

extracting the rest of graphic data by subtracting the graphic data of only X
direction from said input design data as V-line data so that said rest of the graphic data
corresponds to the V-line data extending in Y direction.

14. The mask fabrication method as cited in Claim 8, wherein
a rotation angle of said rotation is approximately 90 degrees with regard to said
object to be exposed.

24 15. A fabrication method of a semiconductor device including a lithography
process for projecting a desired pattern on an object to be exposed using a reflective
mask for an exposure light, comprising the steps of:

30 providing respective reflective mask each having a mask pattern consisting of
only pattern forming elements of the same direction with regard to the respective
direction by dividing pattern forming elements of the mask pattern corresponding to
said desired pattern relative to a projection vector of the exposure light;

sequentially carrying out projection of said mask pattern on said object to be
exposed by irradiating said exposure light and its reflection light with regard to

respective reflective mask in the respective direction; and

rotating, when one reflective mask is changed to the other reflective mask, said other reflective mask and said object to be exposed so that an angle of the pattern forming elements of said the other reflective mask and the projection vector becomes equal to an angle of the pattern forming elements of said one reflective mask and the projection vector.

16. The fabrication method of a semiconductor device as cited in Claim 15, wherein

12 said reflective mask of the respective direction includes a V-line mask having a pattern only including the pattern forming elements perpendicular to said projection vector, and an H-line mask having a pattern only including the pattern forming elements horizontal to said projection vector.

17. The fabrication method of a semiconductor device as cited in Claim 15, wherein

18 said exposure light is one of a charged particle beam, an X-ray, an Extreme Ultra Violet ray, an Ultra Violet ray, and a visible light.

18. The fabrication method of a semiconductor device as cited in Claim 17, wherein

said charged particle beam is one of an electron beam and an ion beam.

24 19. The fabrication method of a semiconductor device as cited in Claim 16, wherein

a perpendicular direction of the mask pattern including the pattern forming elements formed on said V-line mask relative to said projection vector corresponds to an operating direction of an exposure apparatus.

30 20. The fabrication method of a semiconductor device as cited in Claim 15, wherein

a rotation angle of said rotation is approximately 90 degrees with regard to

said object to be exposed.